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CONNECTIVE CITIES

Connective Cities Dialogue Event

Climate protection through circular waste management

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Partners of Connective Cities

Deutscher Städtetag

ENGAGEMENT GLOBAL
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Content

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Preface

Wasting waste? Simply accumulating refuse in open dumps not only means to forgo chances to generate some income to refinance public services, it is also harmful to the environment, locally and on a global scale. Circular waste management helps to protect our climate. The more valuables are salvaged from refuse, recycled and made available as secondary resources in the loop of the economic circle, the less greenhouse gases are emitted. Regeneration is needed as natural resources dwindle in face of an unbroken global trend towards more consumer-oriented mindsets.

Solid waste management is one of the most important duties of cities and requires both knowledge and financial resources. Salvaging the potential of solid municipal waste as a secondary resource for recycling requires infrastructure for sorting, most commonly at the source, as much as awareness, knowledge and motivation among all those living and working in cities and communities. Which is to be first – intention to sort, or sorting infrastructure? How to integrate the private and informal sector into circular waste management? How to address challenges associated with a sudden influx of refugees? How to tackle the problems and potentials around organic waste? These and many more practical questions framed the reference for this Connective Cities' Dialogue Event.

It was the Stadtreinigung Hamburg (SRH), the municipal company for solid waste management and cleaning, who proposed the topic for this international dialogue of practitioners linking the issues of climate protection, circular economy and modern solid waste management, a field where municipal action is co-shaping our global destiny.

The Connective Cities' team and its partners would like to express their cordial gratitude to the Free and Hanseatic City of Hamburg and SRH for sharing their visions and ideas, for hosting this event and for their excellent cooperation and generosity.

The main results of the event are documented in this report. Major aspects of the topic as well as the local experiences are laid out, showcasing examples of good practices, identifying concrete challenges as well as solutions. We hope you will be inspired by the examples and experiences presented.

Benjamin Jeromin and Alexander Wagner

Visit of the sorting facility for bulky waste EGN in Neuss during the study tour previous to the dialogue event.

Connective Cities – An International Community of Practice for Sustainable Urban Development

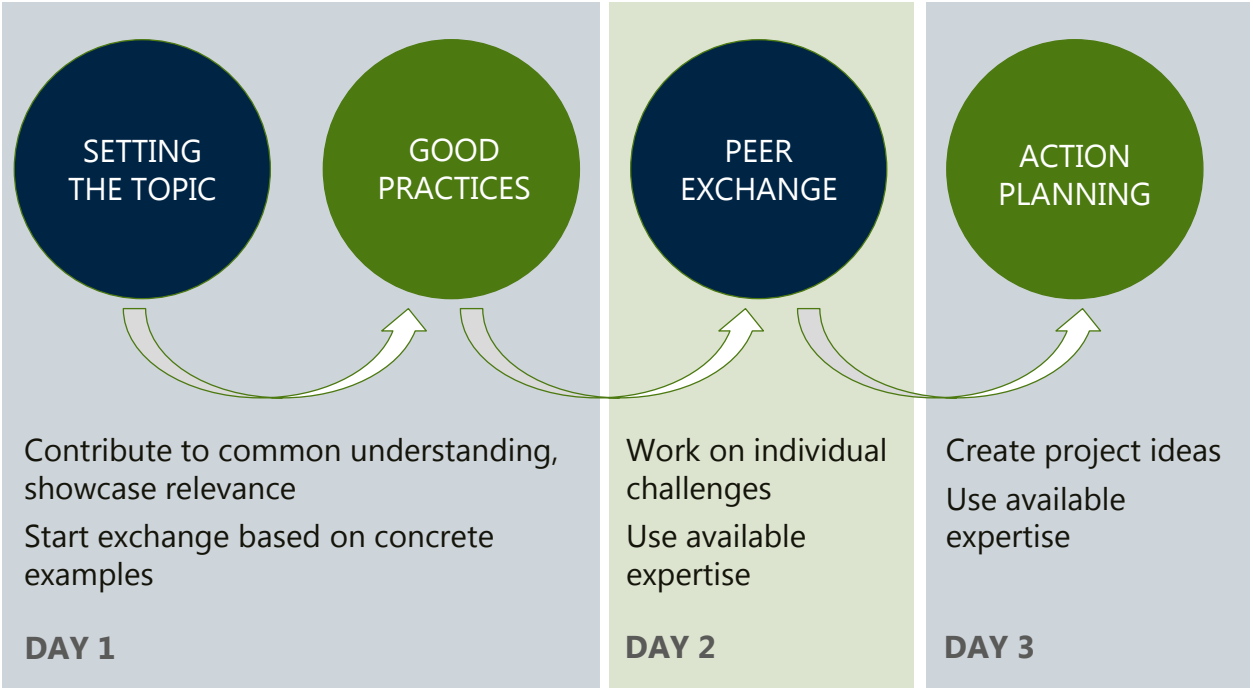
The Connective Cities platform provides opportunities for local practitioners from municipalities across the globe to share their expert knowledge and experiences in four thematic areas: good urban governance, integrated urban development, municipal services and local economic development.

By organising dialogue formats in different parts of the world, Connective Cities facilitates multi-stakeholder exchange, peer-to-peer learning and networking opportunities among urban practitioners from local administrations, the private sector, academia and civil society. Connective Cities' dialogue formats create an environment that stimulates innovative ideas and strategies to solve local challenges. In many cases, the discussions lead to longer-term, practical change processes among the participating cities which are further supported through local project workshops, study tours, expert assignments and virtual discussion fora.

The project is jointly carried out by the German Association of Cities (Deutscher Städtetag), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Service Agency Communities in One World of Engagement Global, and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ).

For more information, including the Connective Cities good practice and expert databases, please visit:
www.connective-cities.net

Our Dialogue Events in four Steps



Introduction to the Topic

Circular Waste Management and Climate Change

Waste-Climate Nexus

Inappropriately managed solid waste contributes directly to global warming by emitting carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4).

Methane is especially harmful to the climate. It is generated when organic waste decomposes in open waste dumps. According to a study conducted on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), developing and emerging countries can reduce the total amount of greenhouse gas (GHG) emissions by 5 percent by adopting modern municipal waste management systems and even by 10 percent, if biodegradable organic matter is processed and reused.

It is not only waste management itself which can contribute to reducing GHG emissions:
By adopting the "**3Rs**" – reducing, recycling, reusing materials – less greenhouse gases are released for extracting, transporting and refining primary substances and for manufacturing products.

These savings increase further if heat and electricity are regained from otherwise non-reusable refuse by waste-to-energy-strategies.

> *"Managing solid waste well and affordably is one of the key challenges of the 21st century, and one of the key responsibilities of a city government. It may not be the biggest vote-winner, but it has the capacity to become a full-scale crisis, and a definite vote-loser, if things go wrong."*
>
> *UN Habitat, Solid Waste Management in the World's Cities, 2010.*

Experts during the exchange on circular waste management.

Urban practitioners visit the recycling station Rondenbarg.

Challenges on the Local Level

While the need for a climate-sensitive waste management is widely acknowledged, its implementation is difficult when municipalities lack both financial and human capacities to successfully manage waste.

In Germany strict legislation to implement circular economy in waste management has forced improvements. Indeed the carbon footprint of public service companies in municipal waste management in Hamburg and elsewhere in Germany has improved: More than half of the municipal solid waste is recycled, especially paper, glass, plastics and organic waste. Still there are plenty of challenges: Recycling quotas could still be boosted. Separate collection systems are still often utilised improperly at the source, for example mixed waste ends up in bins and containers reserved for specific materials as packaging waste. Therefore the quality of assorted waste often is not yet as it could be. Separating and handling organic waste is posing particular challenges, too.

Experts share their approaches to circular waste management.

The welcome reception in the City Hall of Hamburg.

Mr. Wolfgang Grätz during the welcome reception in the City Hall of Hamburg.

Welcoming and Thematic Inputs

During a reception at the City Hall of Hamburg, **Wolfgang Grätz, Deputy Director of the Department for International Cooperation of the Chancellery of the Senate,** welcomed the participants to a city with a long and rich experience in management and reuse of waste: In the late 19th century Hamburg built the first incineration plant on mainland Europe. It used its own steam to meet its energy demands; scrap metal was recovered by magnet. In 1893 a combined heat and power station went on grid: Hamburg's City Hall was served by district heating to avoid additional emissions in the city centre.

Quoting **Stadtreinigung Hamburg** (SRH)'s catchy claim phrase "Climate and resource protection is our business", **Professor Dr Rüdiger Siechau, CEO of Stadtreinigung Hamburg (SRH)**, explained how Hamburg has integrated its waste management into the overarching goals to achieve more sustainability in the city. Today SRH's waste processing is providing district heating for 141,000 families and electricity sufficient to serve 85,000 two-person households. Waste is collected in a four bin colour-coded system: green for bio waste, blue for paper, yellow for packaging and plastics, and grey for residuals. Sorting and recycling is a necessity as unprocessed waste is banned from landfills by national law. In order to save even more CO_2 and resources SRH and Hamburg do not

Prof. Dr. Siechau: "Climate and resource protection is our business"

shy away from considerable investments: For example the new Biogas- und Kompostwerk Bützberg is a modern dry fermentation and composting plant.

An outdated incineration plant is being demolished and replaced by the Centre of Resources and Energy (ZRE[1]). In 2023, municipal solid waste and bio waste will be sorted there – quality-oriented sorting at the source in Hamburg's densely populated West has proven to be difficult. Leftovers of sorted residual waste will be digested in an anaerobic process; two combined heat and power plants are to produce refuse derived fuels (RDF). It is going to be lighthouse project, singular in its kind in Germany, reaching out to the waste management systems of the future.

Rather than only reacting to emerging law requirements on EU, national and Länder level, Hamburg and its municipal service company for waste management SRH are developing visions on how to contribute to achieving circular economy and providing for Hamburg's share to this global task.

1 Zentrum für Ressourcen und Energie

Stadtreinigung Hamburg (SHR)
is a public company owned by the Free and Hanseatic City of Hamburg (755 km², 2.8 million inhabitants in 930,000 households) since 1994.

Employees:	3,500 (incl. subsidiaries)
Company sites:	30
Annual turnover:	380 million EUR, mostly from fees and charges

Tasks:
- Waste management services for all private households and for commercial and industrial entities – including emptying more than 33,000 bins in public spaces and removing illegally disposed waste in round about 19,000 instances per year.
- Energy production from waste and renewable sources (more than 1,442 thousand MWh per year) and its distribution
- Weekly cleaning of more than 4,500 km of roads and streets, more than 5,300 km pedestrian walkways and parks with removing up to 15,000 tons of leaves in autumn.
- Winter services – keeping more than 3,300 km of roads, 8,200 pedestrian crossings, 800 km pedestrian and bicycle lanes and 4,000 bus stops free of ice and snow.
- Maintenance of public toilets.

Of more than 770,000 tons of solid waste collected from private households, 1,449 tons are reused. More than 291 thousand tons are materially and over 476 thousand tons are thermically recycled.

Substituting fossil fuels with energy generated from waste by SRH resulted in avoiding more than 420 thousand tons of CO_2 in the year 2015.

Hamburg also calculated CO_2 savings through sorting and re-using valuable recyclables: 242,528 tons of CO_2 were avoided considering pre- and post-processing chains.

www.stadtreinigung.hamburg/international/englisch.html

Control centre of the waste incineration plant Rugenberger Damm.

Dr Johannes Paul, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, provided an international perspective on challenges and opportunities in cities of the Global South on behalf of GIZ's Sector Project "concepts for sustainable waste management and circular economy".

Linear models of supply flows are still prevalent and it is challenging to switch to circular economy strategies in order to be able to substitute primary resource extraction. With incomes increasing, waste generation tends to grow and the composition of refuse is changing. Often planning designs of waste management and landfills are not state of the art anymore. The deal is to decouple rising standards of living from waste generation; however, reality is often marked by under-financed waste management. Waste is frequently still dumped with negative consequences for the environment, be it for the groundwater, be it regarding waterways. Marine surroundings, too, are in danger of getting littered and polluted by leachates. Avoidable greenhouse gases are emitted. Another challenge: Landfills in tropical countries are fire-prone.

Custom-made solutions fitting the realities on the ground can improve the situation significantly. A good example is a project at the low-cost Eco-Centre San Carlos City in the Philippines: "Rutschen-Sortierung", the chute sorting technique, was developed a hundred years ago in Hamburg. Here gravity is used to separate municipal waste. At the Centre more than 3,000 tons of bio waste, which was simply dumped before that, was recovered for composting and put to use and value.

Twitter ***@waste2circular***

Paul Johannes (GIZ) shares an overview of the challenges and approaches of solid waste management.

Miriam Danne (VKU) shows how concrete projects can create a positive impact.

Miriam Danne is Policy Officer for the German Association of Local Utilities (VKU) and Coordinator for "Let's Clean Up Europe" and the "European Week for Waste Reduction". The next campaign will take place from 17th to 25th November 2018, featuring 13,400 activities in 30 countries – from raising awareness and sharing information to starting new initiatives, creating networks, initialising political reforms and presenting local projects such as the deposit "Freiburg Cup".

www.ewwr.eu/en/project/main-features

The Freiburg Cup

In Germany 2,800,000,000 disposable cups from coffee shops are overfilling public trash bins each year; it is non-recyclable waste. Freiburg introduced city-branded reusable cups: Customers receive them against a deposit of one Euro which they can recollect once they hand in the empty cup at any participating coffee shop. The cups are then cleaned and used again for coffee to go.

German Association of Local Utilities (VKU)

VKU is a network of local and municipal utilities or enterprises in (majority) public ownership. VKU's 1,458 member companies provide services in general interest in an ecologically and socially responsible manner, looking at citizens' instead of shareholders' value. With a turnover of over 115,000 million EUR they employ more than 262,000 staff members, mainly in the fields of waste management, sewage, district heating, electricity, gas, broadband, and traffic. The VKU organises an internal exchange of ideas and experiences among its members and helps to shape opinions and policies on all levels. For more information visit ***www.vku.de***

Local Experiences

Waste Separation and Collection

The Principles of Waste Separation (Stadtreinigung Hamburg, Germany)
In order to keep as many materials as feasible in the loop for as long as possible, Hamburg has established two collection systems. For one, SRH picks up grey household bins and underground containers for residual waste, as well as bins for paper, lightweight packaging/ plastics and organic waste, and in addition bulky household waste from the roadside. For two, clients can bring in waste themselves e.g. to depot containers, as regarding glass and textiles, or to recycling centres that care for smaller fractions, too, such as electronic waste, batteries, tires, wood, hazardous items etc.

Separation at the source is legally mandatory in Hamburg; the municipality's regulations are integrated into strict legal frameworks on different levels which are rooted in the European Waste Directive according to the cascading **hierarchy of waste management** objectives, namely to

1) **avoid and reduce the occurrence of waste** in the first place,
2) to prepare waste for **reuse**,
3) if not re-usable to **recycle** it,
4) if this is not feasible to otherwise use it, to **recover at least its inherent (thermal) energy** and
5) only at very last resort to **eliminate** it.

Hamburg started to educate the public in the late 80s already. In moving to its sophisticated system of differentiated treatment of waste, Hamburg learnt that infrastructure groundwork is needed as a first step, followed then by educative initiatives. After a waste analysis study SHR launched visible public campaigns for sorting recyclables at the source – with considerable success: more recyclables were collected indeed. Recyclables are gathered free of charge from clients, whereas residual waste is only taken against a fee.

Making use of organic waste turned out to be particularly successful by producing storable biogas and compost for agricultural use.

Field visit on waste separation in Hamburg, Germany.

Mr. Mohammed Sajid, Municipality of Benslimane, Morocco.

Mr. Omar Elarabiyat, Amman Municipality, Jordan.

Waste Separation System (Municipality of Benslimane, Morocco)

Benslimane is moving towards a waste separation system in a progressive manner. Based on a legislative framework and a national programme for municipal waste management that seeks to achieve a rate of 20 percent in recycling by 2022, at first some neighbourhoods are targeted for introducing a waste separation system. The pilot project is then to be extended to the whole municipality in order to address the growth of population – the number of inhabitants is expected to (almost) double by 2024. In addition an intercommunal sorting and transfer centre is to be built.

Analysing the current situation of waste management in the municipality and within the informal sector is important. About 70 percent of waste in Benslimane is organic; a composting project is being developed in hope to reduce the amount of waste which now is deposited in a landfill.

Ms. Jomanah Al Btoush (GIZ) and Mr. Yousef Aldabalih, Amman Municipality, Jordan.

Climate and Resource Protection through Circular Economy in Greater Amman Municipality (GAM), Jordan

Creating the prerequisites for the practical introduction of a climate-friendly circular economy in Greater Amman Municipality (GAM) – this is what the project "CIRCLE" is about. CIRCLE stands for "Climate and Resource Protection through Circular Economy" and is a project the municipality is implementing together with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

3,200 tons of waste are collected day by day from a population of now 4.5 million which is set to grow. About half of the waste is organic; the composition of waste changes slightly with the seasons. Separation at the source will first be introduced in three pilot districts of GAM, experiences made will be used when extending the concept to the whole city area. The staff of Amman Municipality will be trained on circular economy. Community members', esp. women's, participation is seen as a significant component and will be integrated into the national training programme for circular economy.

Mr. Vadym Nozdria explains the challenges in Lviv, Ukraine.

Municipal Solid Waste System (Lviv, Ukraine)
Municipal solid waste management in Lviv is undergoing a systemic transformation.

All solid waste used to be deposited in Hrybovichi landfill established during Soviet times in 1953. In May 2016 a tragic accident killed four people at the landfill after a fire broke out, resulting in a waste-slide.

Since then the landfill has been closed and is awaiting rehabilitation. The tragedy prompted the municipality to rethink solid waste management entirely. The challenges are huge, given the need for immediate solutions as well as the limited access to financial resources. Not only a modern type of infrastructure for waste management needs to be built from scratch, it is also important to promote separation at the source among the population and advance zero-waste arrangements – while at the same time needed increases of fees are difficult to implement. Lviv municipality has been seeking ideas and experiences from other cities in Europe in order to find a pragmatic approach for selective collection.

Reuse, Recycling and Recovery, including Waste-to-Energy

The Potential of Organic Waste for Biogas Production and Composting (Stadtreinigung Hamburg, Germany)
Hamburg successfully established a system to make good use of the resource organic waste.

Green waste from gardens is collected through collection and bring-in interfaces. This is treated at the Biogas- und Kompostwerk Bützberg, where it is composted and biogas and humus are yielded. Round about 35,000 tons of compost are sold to private gardeners and agricultural enterprises each year.

Commercial organic waste, for example from restaurants and shops, is collected through a special system and wet-fermented at the BioWerk Plant.

For more information on the BioWerk Plant, please refer to p. 20.

Ms. Dr. Antje Boisch during a site visit on composting and biogas production.

Leaves collected undergo special treatment and are converted to agricultural fertiliser in form of pellets. Wood, including treated wood as from construction or furniture, is collected separately and used for energy production.

2.5 to 2.8 million m³ treated bio-methane are being fed into the main gas distribution system each year with an energy content of 25 million kWh. Besides revenue and energy generation, this approach is an efficient way to reduce negative impacts on the climate. Substantial and energetic recycling of bio waste is becoming more and more important against this background as well as the implementation of the waste hierarchy principle.

Mr. Mustafa Yilmaz, Gaziantep, Turkey.

Solid Waste Transfer Stations Of Gaziantep, Turkey
Uncontrolled dumping sites in Gaziantep used to cause hazards to human health and the environment: the quality of underground water was endangered by leakage. Moreover, waste easily ignites and this can cause unforeseeable chemical reactions. Therefore Gaziantep built two solid waste transfer stations with financial support of UNDP.

Fevzipasa Solid Waste Transfer Station started to operate in May 2017, the one in Muratli in January 2018. Equipped with semi-trailers, towing vehicles and loaders, they can handle 200 tons of waste a day from different districts to make sure the waste is eventually deposited in regulated sanitary landfills where energy is generated from decomposition-gas. Waste management infrastructure helps to provide additional jobs and to protect the environment.

Why not simply incinerate organic waste?
From a cost perspective a biomass power plant shows no considerable advantages over incineration and generating energy that way. However, incinerating means that no phosphorus can be salvaged. In Germany, deposits of phosphorus will be depleted in 80 to 90 years, given current consumption levels. Special treatment of organic waste can retrieve phosphorus and produce compost, adding to more sustainable agricultural practices.

Mr. Wolfgang Kleiner explains how recycled construction material was used in Würzburg, Germany.

Using Recycled Construction Material for the New Local Centre of Environmental Education and Information (Würzburg, Germany)

The municipal government of Würzburg joined hands with the public company "Die Stadtreiniger" which is active in the field of circular economy. The company wanted to build a new local centre for environmental education and information. In doing so it decided to adhere to the principles of reuse and recycling and chose to use waste material from construction and demolition. The technical university BTU Cottbus assisted with developing a suitable recycling concept for concrete from demolition sites which under old practices would have been dumped into a landfill, occupying space. While optical deficiencies maybe visible, depending on how the material was processed, the recycled material shows the same characteristics as conventional concrete. At almost the same costs, resources like sand can be conserved if old concrete is recycled. Given the piloting experience the local government was willing to shoulder additional costs for the prototype eco-building; eventually funding partners helped to reduce the extra expenses of the interesting project. Collaboration with research institutions to develop innovative technologies and methods to recycle concrete and work with it proved to be the key to success.

Regional Solid Waste Management System (Kuşadası, Turkey)

Kuşadası county is transforming its solid waste management on different levels. The area is a tourism hub, reliable and sustainable solid waste management is therefore important for the local private sector. The high seasonal fluctuation of inhabitants, including tourists, poses special challenges. Turkish regulations need to be implemented and moreover, in order to accelerate the perspective of Turkey joining the EU, complying with the EU Directives concerning sanitary landfills and packaging waste is on the agenda. Therefore Kuş-Atak Municipalities Union, made up of four municipalities and six villages, cooperates with national and European institutions to provide sustainable and integrated waste solutions for existing wild landfills. In addition reuse and recycling in Kuşadası and neighbouring municipalities is being promoted.

Kuşadası's new sanitary land fill was first used at the end of 2009. It is to operate for 20 years, taking into consideration that the amount of waste is considered to nearly double from 77,200 tons in 2005 to 151,500 tons in 2025. Studies and research is ongoing, aiming to reduce waste amounts, e.g. by making better use of organic waste – in terms of biogas, electricity, compost and organic fertiliser. A recycling centre, too, has been built, dealing with paper, glass, metal, electronic goods and construction waste, among others. To deal with packaging waste, of which the tourism industry generates plenty, a collection and separation plant with a capacity of at least 2 tons per hour started to operate in 2010. Campaigns for sorting at the source have been run successfully.

Kuşadası's Municipality staff for cleaning works shows its commitment by offering training sessions and excursions with schools – in 2017 about 5,000 students of 30 schools learnt the basics of waste management.

Ms. Dr. Ayşe Şerifoğlu from Kuşadası, Turkey.

Capacity and Coalition Building for Solid Waste Management Projects

The good practice presentation by Mr. Peter Hofmann, district of Marl, Germany.

Communication and Public Acceptance of a Central Facility for Municipal Services (City of Marl, Germany)
The municipal company "Zentraler Betriebshof der Stadt Marl" (ZBH), the central facility for municipal services in Marl, decided to improve its image and identified three target groups to address: employees, customers and politicians. In order to improve visibility the tasks of the municipal company were presented and explained to the public. Additional communication channels, such as social media, are to be used. Operating procedures were optimised and the working atmosphere was improved. As a result, employees are more cooperative and team spirit has increased. Public relations with the customers were established and public perception is now changing slowly but steadily. Politicians identify better with "their company" now. In future the range of services is to be expanded and demographic change will be considered.

Waste Management System in Moldova (Kassel, Germany and Telita, Moldova)
In developing a local waste management system in the District of Anenii Noi in the Republic of Moldova, the municipalities Calfa, Roşcani, Speia and Telița joined hands with the District of Kassel: The municipalities formed a network on waste management. An inclusive approach towards the public has been featuring high on the agenda from the very start. Awareness in the region on preventing waste could be improved. The idea of circular economy is not yet common and there is resistance against the fact that waste management costs need to be covered by the households. The way ahead is considered to be a tedious one, so planning and implementation puts pragmatism, open mindedness and flexibility into the centre of a step-by-step approach. An awareness campaign includes measures at schools. The initial results give reason for optimism and motivation: The public is interested in the project and boxes installed to separate waste are indeed used. Moreover local politics has shown interest in working on the issue.

Kariba Integrated Solid Waste Management Project (Municipality of Kariba, Zimbabwe)
Kariba considers its solid waste collection and transportation system to be less efficient and more costly than it could be. Illegal dumping is common and not all the waste is collected. The volume of unsorted waste at the disposal site is high. Low community participation was found to be one cause of the problems. Thus, ways were sought to engage the public in a better way. Stakeholders were mapped, consultative workshops held and municipal community projects launched. An Integrated Solid

The good practice presentation by Mr. Casper Mutumbami from Kariba, Zimbabwe.

The good practice presentation by Mr. Moses Tawedzera from Kariba, Zimbabwe.

Waste Management Plan was eventually developed in a multi-stakeholder process. It turned out that traditional community knowledge needed to be included into the plan. Community interest groups needed to be motivated and trained to share it. The municipality practitioners needed to undergo capacity development to ensure a guiding and leading role in the process. The results show that efforts are well-invested, as stakeholder involvement brings many comparative advantages. With the launching of the Integrated Solid Waste Management Plan in February 2018 public engagement is set to continue but funds to do so are scarce.

Capacity Development as an Instrument for Environmental Change, Climate Protection and Waste Management (Jundiai, Brazil)

Jundiai wants to do its part in changing harmful waste management patterns – together with Lüneburg, the Technische Universität Braunschweig and public schools in Jundiai, among others.

Whereas a national waste policy entered into force in Brazil in 2010, about 40 percent of waste is still being disposed of at dumpsites and water bodies. Almost no technology is available to extract useable substances or to put waste to value in other ways than energy production.

www.nakopajundiai.com.br

The cooperation project between Lüneburg and Jundiai focuses on environmental education and operational training, e.g. by studying waste treatment plants in Brazil and Germany. The aim is to reach out to as many people as possible to raise awareness for the negative impacts of waste on the environment, climate and public health.

Waste collection services and the selective collection of recyclables are to be improved. During the initial project phase it became clear that the population is indeed concerned about waste problems and basic information about the municipal waste system is still lacking.

2,000 students, 160 teachers and educational staff participated at seminars and environmental learning lessons. 500 participants attended technical seminars.

The promising result so far: 70 percent less irregular disposal of waste on green areas and into water bodies.

The good practice presentation by Mr. Marcio Moraes from Jundiai, Brazil.

Peer-to-Peer Advising Sessions

Structured peer-to-peer advice has already helped many Connective Cities' practitioners to unleash the full potential of their know-how and experience. Challenges can at times show delicate twists. This is why the following reports are anonymous summaries.

Challenge: Electronic waste is increasing in our community

Handling electronic waste is increasingly challenging, be it fires attributed to salvaging metals from electronic waste in an uncontrolled manner, be it a landfill approaching its limits too fast as imported used electronics with brief life-cycles are dumped in large amounts.

This is what peers suggested to do:

- Establish a legal framework and introduce fees in order to reduce electronic waste.
- Introduce a sorting system: Electronic waste contains valuables suitable to do regular business with.
- Obtain further financial means, e.g. to procure an additional car to collect electronic waste separately to increase efficiency in recovering valuable materials.

Challenge: How to establish selective collection from scratch

Moving from indiscriminate dumping to circular flow economy is not an easy task. Only once pre-sorting at the source takes place – and respective containers for waste selection as separate bins are available – can the system be transformed. Is it better to make one big leap or to move in smaller steps? How can companies contracted for collection be persuaded to provide separate containers? This is what you can try according to peer advice:

- Move towards a system where the municipality owns the bins.
- Start a pilot project to test the acceptance of pre-sorting.
- Start by introducing two separate bins; maybe add two more at a later stage in a second step.

Challenge: Low bin coverage at household level renders separation at the source difficult

Removing illegal dumps is costly. Managing waste at the source effectively depends on containers made available, in adequate numbers and capacities. Yet, this is expensive, too.

Peers advised:

- Think of alternatives to pricey bins, such as bags.
- Bags, however, may bring complications. They are less durable and easy prey for wild animals which might litter the collection area. Therefore bags should be put by the roadside just in time. An acoustic signal may announce the approaching collection van – similar to an ice-cream van jingle.
- Illegal dumps are best cleared by excavators.

Challenge: How to cope with problems in waste management that are connected to the refugee crisis

The more people, the more waste. A separation system which permanent residents are used to may be unknown to refugees who perceive themselves in temporary transit and no deep rooted interest to integrate into habitual waste management routines. In consequence conflicts may occur with streets being littered and landfills reaching their limits faster than projected. Peers suggested the following:

- Reduce waste volumes by separating and do so after collection, when there is little prospect to change habits at the source in a refugee camp.
- Look for further support from the EU.

Challenge: How to integrate the shadow sector into selective waste collection

Retrieving marketable goods from waste is a small business opportunity especially for the poor. Some of them work on their own account, while others belong to quasi-enterprises. But if waste is deprived of even modest values, the opportunities to partially refinance public waste management are depleted. Peers had the following advice:

- Build underground containers that are not easily accessible.
- Establish a strict time schedule for the collection of bins and bags – leaving less opportunity for scavengers.
- Issue licences to private, and maybe charity oriented, organisations to let them find solutions in their interest.
- Include the informal shadow sector workers into the formal labour market in waste management; look for partnership with informal companies or become their competitor.

"We preach to the people to sort waste – but we do not yet practice it ourselves in our own public buildings."

a participant

Electronic waste ready to be recycled.

Action Planning and Next Steps

During the final phase of the Connective Cities' dialogue event municipal practitioners drafted concrete project ideas to be put into action. Connective Cities and the Service Agency Communities in One World of Engagement Global stand prepared to offer further support.

Joint action planning for Public Amenity Centres.

Mr. Dr. Stefan Lübben and Mr. Casper Mutumbami

Two Projects regarding Public Amenity Centres

Lviv and Greater Amman consider setting up public amenity centres. While some details of the envisaged implementation vary according to the particular needs of the respective municipality, the general project layouts were carved out together.

Objective:
Establishing Public Amenity Centres in Lviv and Greater Amman Municipality

Project Sketch:
Since efficiency in recycling waste goes hand in hand with effective sorting, public amenity centres can help to bring about circular economy. In planning the public amenity centres, the structure and functionality of the centres and the underlying eco-enterprise need to be defined, potential markets and destinations for the salvaged materials need to be analysed and identified. A municipal collection system for e-waste as well as for bulky waste needs to be considered. Informed decisions are required, as well as the fractions to be collected, designating and authorising a suitable operational company for the centres, among others. Catchment areas, zones and finally the locations for the centres must be identified, plots of land provided and permissions for building the centres obtained.
A public awareness programme will promote the public amenity centres continuously.

Project: Enhance Recycling Practice, in Particular Regarding Plastics and Bottles in Kariba, Zimbabwe

Objective:
A cleaner Central Business District and a dumpsite free from recyclable materials

Project Sketch:
A littered city can pose health hazards. Encouraging proper waste handling and sorting at the source depends on whether the importance of recyclables is being perceived. Thus awareness is to be raised by education and training measures. A business model on recycling will be developed reflecting the results of a cost-benefit-analysis. Infrastructure is to be upgraded, either by installing waste bins at identified sites or by constructing storage facilities and transfer stations. By-laws on waste separation at the source and enforcing them consequently will boost recycling.

Turkish municipalities have to rapidly increase their capacities in solid waste management.

Action planning with the city of Jundiai, Brazil.

Project: Create Training Programmes on Suitable Solid Waste Management for Migrating Target Groups

Objective:
Integrating Syrian refugees in Yayladağı into the established waste management system in the District of Hatay, Turkey

Project Sketch:
The Turkish border town Yayladağı has 23,000 permanent residents and currently hosts 40,000 Syrian refugees who tend to concentrate themselves in some parts of the city rather than living in camps. Cleaning litter from public areas and depositing waste from an almost doubled number of inhabitants poses big challenges for the city both in terms of unplanned costs as well as in using the limited capacities at the landfill that was designed for a much smaller population. More diligent disposal of waste by refugees through the existing infrastructure and better pre-sorting could help to mitigate the problems. As there are no language problems an educative awareness and training programme could offer some relief. To develop a targeted programme and suitable contents, a survey based on interviews of refugees need to be conducted, instructors and technical staff needs to be recruited by a project group. Existing national institutions shall be integrated into the project. A pilot scheme can offer opportunities for refinement before rolling out the complete project.

Project: Recycling to Connect People, Including the Informal Sector into Waste Management, in Jundiai, Brazil

Objective:
"Formalise" and shape the informal sector

Project Sketch:
Informal activities have always been a component in the realities of dealing with waste. The project aims at unleashing their potential rather than letting them obstruct procedures in municipal waste management.

Bringing the informal sector under control, or even regulating it, is challenging. The project will start with mapping the activities of the informal sector looking both at individual scavengers and other private sector actors – taking into account their attitudes towards the intention of the municipality to transform current practices. A survey will be done which will include an analysis of spatial data. A concept for establishing a partnership between the informal sector and the municipality is to be developed by identifying advantages and "wins" for each targeted group. Their institutionalisation might help to bring about an approach on eye level between municipality and private sector actors. The project envisages a market regulation, formal agreements with the informal sector as well as a repository of tools to be published – as a handbook and in form of an app.

Field Visits

Participants visited several company sites of SRH. While one group had a look at the car pool for Region West, where SHR uses 731 vehicles in total, 200 of which are waste collection vans, another field visit explored the innovative BioWerk Stellingen. Here energy from bio waste from restaurants, the food industry and retail shops is recovered. This waste tends to be low in structure but high in energy – unsuitable for dry fermentation. Leftovers are washed out of packages and the sludge is hydrolysed and fermented. The BioWerk produces heat and electricity. In 2016, 2,212 tons of CO_2 were saved this way.

The plant is financed by selling energy and from special collection fees; investments will be recouped after 15 years of operation.

Participants also visited the recycling station Rondenbarg, one of 12 bring-in centres in Hamburg which are used to collect almost 100 thousand tons of solid municipal waste. Constructed as two platforms on different levels, clients can dispose of materials and items by throwing them down in assorted containers. A high shelf storage system is available for fractions as used oil, old gas bottles, batteries etc. Services are free of charge for citizens of Hamburg who already pay regular waste fees; people coming from outside the city need to contribute to the costs in cash or by credit card. Items still usable – like old bicycles, etc. – are collected for refurbishment or immediate sale in two special second-hand shops SRH runs. When it comes to e-waste old motherboards are the most valuable components: one ton yields 4,500 EUR.

The waste incineration plant Rugenberger Damm, which the participants explored, processes 320,000 tons of waste per year in average.

In 2016 it provided more than 52, 000 MWh to district heating and more than half a million MWh in process steam. It generated more than 77,000 MWh of electricity, a little more than half of it was sold.

During the incineration process, valuables such as metals are salvaged – more than 1,000 tons in 2016. Flue gas is cleaned in order to protect air quality. Emissions are being measured constantly.

www.stadtreinigung.hamburg/international/englisch.html

Waste incineration plant Rugenberger Damm.

Field visit of the BioWerk Stellingen.

Recycling station Rondenbarg.

Recycling station Rondenbarg.

Waste incineration plant Rugenberger Damm.

Preparing for the follow-up.

Follow-Up Support

Connective Cities can assist and help to provide support for projects of the participants, e.g. by

- Providing access to information, virtual networking and knowledge exchange through its website www.connective-cities.net. It includes a good practice database, among others.
- Linking experts from Connective Cities' expert pool with interested cities and realise expert missions, study tours, training sessions, local project workshops, webinars and virtual networking.
- Sharing information on funding opportunities and facilitating contact with funding institutions.

The Service Agency Communities in One World of Engagement Global provides a variety of funding opportunities for cooperation projects between German and international municipalities. German partners can apply for different instruments of support.

Please register to receive the Connectives Cities' newsletter at

www.connective-cities.net/en/media-centre/newsletter

https://skew.engagement-global.de/our-offers.html

Info-telephone (from Germany only):
0800 188 7 188

Selection of Documentation from the Connective Cities' Website

Connective Cities' Dialogue Events

- Planning integrated solid waste management at the municipal level (Rostock, Germany, 26/09/2016 to 28/09/2016)
www.connective-cities.net/en/details/veranstaltung/planning-integrated-solid-waste-management-at-the-municipal-level/

- Financing mechanisms for municipal sanitation services – ensuring sustainable local service provision and infrastructure (Cologne, Germany18/09/2017 to 20/09/2017)
www.connective-cities.net/en/details/veranstaltung/finanzierung-kommunaler-dienstleistungen/

Connective Cities' Practitioners' Workshops

- From Waste to Resource – Integrated Municipal Solid Waste Management Solutions (Izmit / Kocaeli, Turkey, 04/07/2017 to 06/07/2017)
www.connective-cities.net/en/details/veranstaltung/from-waste-to-resource-integrated-municipal-solid-waste-management-solutions/

- From Waste to Resource – Planning Integrated Solid Waste Management Solutions (Abdul Hamid Shouman St Shmeisani, Amman, 14/11/2016 to 16/11/2016)
www.connective-cities.net/en/details/veranstaltung/from-waste-to-resource-planning-integrated-solid-waste-management-solutions/

- Solid Waste Management and Recycling (Amman Jordan, 22/05/2016 to 24/05/2016)
www.connective-cities.net/en/details/veranstaltung/solid-waste-management-and-recycling/

- Integrated Solid Waste Management in Sub-Saharan African Cities (Nairobi, Kenya, 02/12/2015 to 04/12/2015)
www.connective-cities.net/en/details/veranstaltung/integrated-solid-waste-management-in-sub-saharan-african-cities/

- From Waste to Resource – Planning for Integrated Solid Waste Management in Sub-Saharan African Cities (Kinondoni/Dar es Salaam, Tanzania 14/04/2015 to 17/04/2015)
www.connective-cities.net/en/details/veranstaltung/from-waste-to-resource-planning-for-integrated-solid-waste-management-in-sub-saharan-african-citie/

Local Project Workshops

- Community-based Solid Waste Management in Nairobi
www.connective-cities.net/en/events/documentations/local-project-workshops/community-based-solid-waste-management-in-nairobi/

Expert Assignments

- Re-Structuring the waste sector in Nairobi/ Strengthening the informal sector for collection, sorting and processing of municipal waste (Expert mission in October 2017 to Nairobi, Kenia)
www.connective-cities.net/en/events/documentations/expert-assignments/strengthening-the-informal-sector-for-collection-sorting-and-processing-of-municipal-waste/

- Collection, sorting and reuse of construction waste (Expert mission in May 2017 to Sfax, Tunisia)
www.connective-cities.net/en/events/documentations/expert-assignments/collection-sorting-and-reuse-of-construction-waste/

Study Tours

- Study Tour and Project Workshop on Solid Waste Management for Jordanian municipalities
www.connective-cities.net/en/events/documentations/study-tours/delegation-from-jordan/

- Study Tour on "Circular Waste Management in Germany" for Turkish municipalities
www.connective-cities.net/en/events/documentations/study-tours/delegation-from-turkey/

List of Participating Institutions

- Albert-Ludwigs-Universität Freiburg, Germany
- AVG Cologne, Germany
- Central facility for municipal services (Zentraler Betriebshof) of the City of Marl, Germany
- City of Benslimane, Morocco
- City of Kariba, Zimbabwe
- City of Lviv, Ukraine
- City of Mwanza, Tanzania
- City of Telita (Anenii-Noi), Moldova
- District Municipality of Konya, Turkey
- Gaziantep Metropolitan Municipality, Turkey
- German Association of Local Utilities (VKU), Germany
- GIZ, Jordanian Communities Hosting Syrian Refugees Project
- GIZ, Sector project "Concepts for sustainable waste management", Hamburg
- Greater Amman Municipality, Jordan
- Karesi Municipality, Turkey
- Kusadasi Municipality, Turkey
- Landkreis Kassel, Germany
- Municipality of Jundiai, Brazil
- Pendik, District Municipality of Istanbul
- Stadt Würzburg, Germany
- Stadtreinigung Hamburg, Germany
- UCLG-MEWA, Turkey
- Union of Municipalities Turkey TBB

Participants at the City Hall Hamburg.

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